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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,297	04/02/2004	Gregory H. Bearman	52316/JWP/C766	1886
23363	7590	07/10/2008	EXAMINER	
CHRISTIE, PARKER & HALE, LLP			WOOD, AMANDA P	
PO BOX 7068			ART UNIT	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/817,297	Applicant(s) BEARMAN ET AL.	
	Examiner AMANDA P. WOOD	Art Unit 1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 17-25 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 17-25 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's response and amendments filed 11 February 2008 have been received and entered.

Claims 14, 17-25 and 29 are presented for consideration on the merits.

Applicant's arguments with respect to claims 14, 17-25 and 29 have been considered but are moot in view of the new ground(s) of rejection.

Withdrawn Claim Objections

Based upon Applicant's arguments, the objection to the claims dated 9 October 2007 has been withdrawn.

Withdrawn Claim Rejections

Based upon Applicant's arguments and amendments to the claims and the Examiner's further consideration, the rejection of claims 14, 18-25 and 29 under 35 U.S.C. 103 has been withdrawn.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figures 6 and 7 do not include reference number 46, or reference numbers for steps 100, 102, 104, 106, or 108, as described on page 7, lines 21-35 and page 8, lines 3-4 of the instant specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the

application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to because the emission spectra shown in Figure 7 (a-d) have no labels indicating what fluorescent dye is being shown in each spectra or what wavelength at which the measurements were made. In particular, Figure 7d does not show "ADC 44" as is described in the specification at page 7, lines 30-31.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

New Claim Objections

Claim 17 is objected to because of the following informalities: Claim 17 depends upon cancelled claim 16. Appropriate correction is required.

New Claim Rejections

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14, 17-25 and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Recktenwald et al (US 4,745,285) in view of Dabiri et al (US 5,871,628).

A system is claimed for monitoring cellular activity in a cellular specimen that contains a plurality of excitable markers, comprising a laser microscope, a tunable filter, a plurality of detectors, and an analyzer.

Recktenwald et al beneficially teach an apparatus comprising a fluorescence microscope with a laser light source which generates a beam of light of a singular

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wavelength, further comprising filters which can filter out extraneous wavelengths (see, for example, col. 3, lines 15-45, and col. 6, lines 25-65). Recktenwald et al further teaches that excitation energy is thus provided in the apparatus by the laser light beam, and fluorescence, if emitted by the cells energized by the illumination from the light source, is typically collected at a 90-degree angle relative to the excitation axis of the incident light beam from the laser. Recktenwald et al teach that to collect the fluorescence at different wavelengths emitted by the cells, the fluorescence signals are separated or split, by a dichroic mirror or beam splitter, and the fluorescence is the collected in different photodetectors, depending on which color region the fluorescence belongs in (see, for example, col. 5, lines 20-45). Recktenwald et al beneficially teach that various filters may be used in conjunction with the photodetectors to obtain the purest signal possible, and further, that many different fluorescent signals may be simultaneously collected at different wavelengths (see, for example, col. 5, lines 50-65). Recktenwald et al beneficially teach that the various photodetectors may be well-known photomultiplier tubes or similar devices which convert light signals into electrical impulses so that the light thereby detected may be associated with the cells flowing through the apparatus. In addition, Recktenwald et al beneficially teach that the apparatus should comprise display, storage and processing electronics (i.e., an analyzer comprising a memory operative and a processor operative) to which the electrical signals from the photodetectors should be fed so that one or more characteristics of the cells under analysis may be determined (see, for example, col. 6, lines 25-45).

Recktenwald et al do not expressly teach a system wherein fluorescence signals are quantitatively analyzed using a linear unmixing operation.

Dabiri et al beneficially teach a system that uses linear unmixing to determine the contribution of fluorescence to a fluorescent spectra made by different fluorophores based upon spectral matching to that found in a stored library of fluorophore spectra (see, for example, col. 11, lines 15-60). Furthermore, Dabiri et al beneficially teach that the spectra of each specific fluorophore is stored in the image processing software and that these known spectra permit spectral unmixing of detected multiple fluorophores, and by using correlation techniques, utilize the full energy in each dye spectra to enhance base-calling detection and accuracy. In addition, Dabiri et al teach that this system allows for more accurate resolution of dyes with similar emission signatures using the entire emission spectra, and therefore, the number of possible dyes that can be used in a single run is expanded (see, for example, col. 10, lines 45-67).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the system and methods disclosed by Recktenwald et al based upon the beneficial teachings provided by Dabiri et al, with respect to the art-recognized use of systems utilizing linear unmixing to resolve fluorescent dyes having similar emission spectra. Recktenwald et al particularly point out that the present apparatus would be useful in determining the characteristics of cells using multiple fluorescence analysis. Furthermore, Dabiri et al beneficially teach that using linear unmixing software was well known in the art and useful for resolving

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fluorophores with overlapping emission spectra, as well as useful for increasing the number of fluorescent dyes that could be used. Therefore, it would have been both obvious and beneficial for the skilled artisan to modify the system taught by Recktenwald et al using the methods provided by Dabiri et al so as to provide the best possible cell imaging apparatus, using known techniques of linear unmixing, filtering light, such as acousto-optical tunable filters, and liquid crystal tunable filters, or using a plurality of photomultiplier tubes, or the high-gain variety. Furthermore, it would have been obvious, based upon the teachings of Recktenwald et al, to use different laser microscopes and different methods for focusing light onto the collector (see, for example col. 5, lines 30-60), and therefore, it would also have been obvious to one of skill in the art to use an integrating sphere as a collector. The result-effective adjustment of particular conventional working conditions (e.g., using different types of filters, detectors, microscopes, or collectors) is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMANDA P. WOOD whose telephone number is (571)272-8141. The examiner can normally be reached on M-F 8:30AM -5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on (571) 272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

APW
Examiner
Art Unit 1657

/Lisa J. Hobbs/
Primary Examiner, Art Unit 1657